November 17, 2008

M E M O R A N D U M

TO: Steve Tanner, Engineering Manager
Coeur d'Alene Regional Office

FROM: Jennifer Wester, Associate Engineer
Technical Services Division

SUBJECT: Twin Lakes Village Wastewater System Wastewater Reuse Permit Application Review – LA-000167-02 (Municipal Wastewater)

1.0 Purpose

The purpose of this memorandum is to satisfy the requirements of IDAPA 58.01.17.400.04 (Wastewater Reclamation and Reuse Regulations) for issuing land application permits. It states the principal facts and significant questions considered in preparing the draft permit conditions or intent to deny, and a summary of the basis for approval or denial with references to applicable requirements and supporting materials. This memorandum supplements that dated July 9, 2001.

2.0 Project Description

The Twin Lakes Village (hereafter TLV) wastewater system serves the privately-owned TLV residential golfing community on the southeast shore of Twin Lakes as well as two separate residential subdivisions (Elkhorn Ranch Estates 2nd and 3rd Additions) located approximately two miles east of the TLV golf course and adjacent to the land application site. The combined effluent is collected and passes through a 0.9 MG aerated lagoon into a 2.8 MG storage lagoon from which it is pumped out to irrigate forested land adjacent to the lagoons during the growing season.

During the non-growing season no wastewater is applied to the site. Effluent from the TLV golf course community is discharged into the drainfields which are comprised of eleven large soil absorption systems (LSASs) totaling 92,100 square feet. One of the community subdivisions discharges to a 5,000 square foot LSAS that is considered separate from the rest of the drainfield system. Only the TLV golfing community is allowed by the Panhandle Health District (PHD) to discharge to the drainfields (see PHD letter dated November 24, 2003 and subsequent email clarification from DEQ dated December 1, 2003 in the Appendix). All effluent from the two subdivisions adjacent to the land application site is collected and stored in the lagoon for application during the following growing season. The projected number of equivalent residence (ER) hookups for the TLV portion of the system is still 500, with the Elkhorn Ranch Estates projected

for 44 more. The system currently has 362 ERs for TLV and 16 Elkhorn Ranch ERs with an additional 28 approved for the 2nd Addition.

3.0 Summary of Events

Twin Lakes Investment Partnership initially received a Wastewater Land Application Permit (WLAP) on September 14, 2001 (hereafter 'current permit'). TLI Sewer, LLC submitted an application for re-permitting on February 7, 2007 (hereafter TLI, 2007). This application was determined complete by DEQ on April 9, 2007.

4.0 Discussion

The following is a discussion of: the plan of operation, silvicultural plan, Spokane Valley – Rathdrum Prairie Aquifer, hydraulic management unit configuration, wastewater flows and constituent loading, lagoons, and drainfields. Conclusions and recommendations are provided in Section 5 below.

4.1 Plan of Operation

Section II of the application (page 3) states that an updated facility Plan of Operation would be submitted after permit issuance as an anticipated permit compliance condition. It is understood that a plan of operation is a living document and is modified as operations and regulatory requirements change. Section E, condition CA-167-01, as it appears in the attached draft permit, requires the facility to submit for DEQ review and approval, a plan of operation which includes a Quality Assurance Project Plan (QAPP) for monitoring activities specified in the permit. For the full text of the condition, see Section E of the attached draft permit.

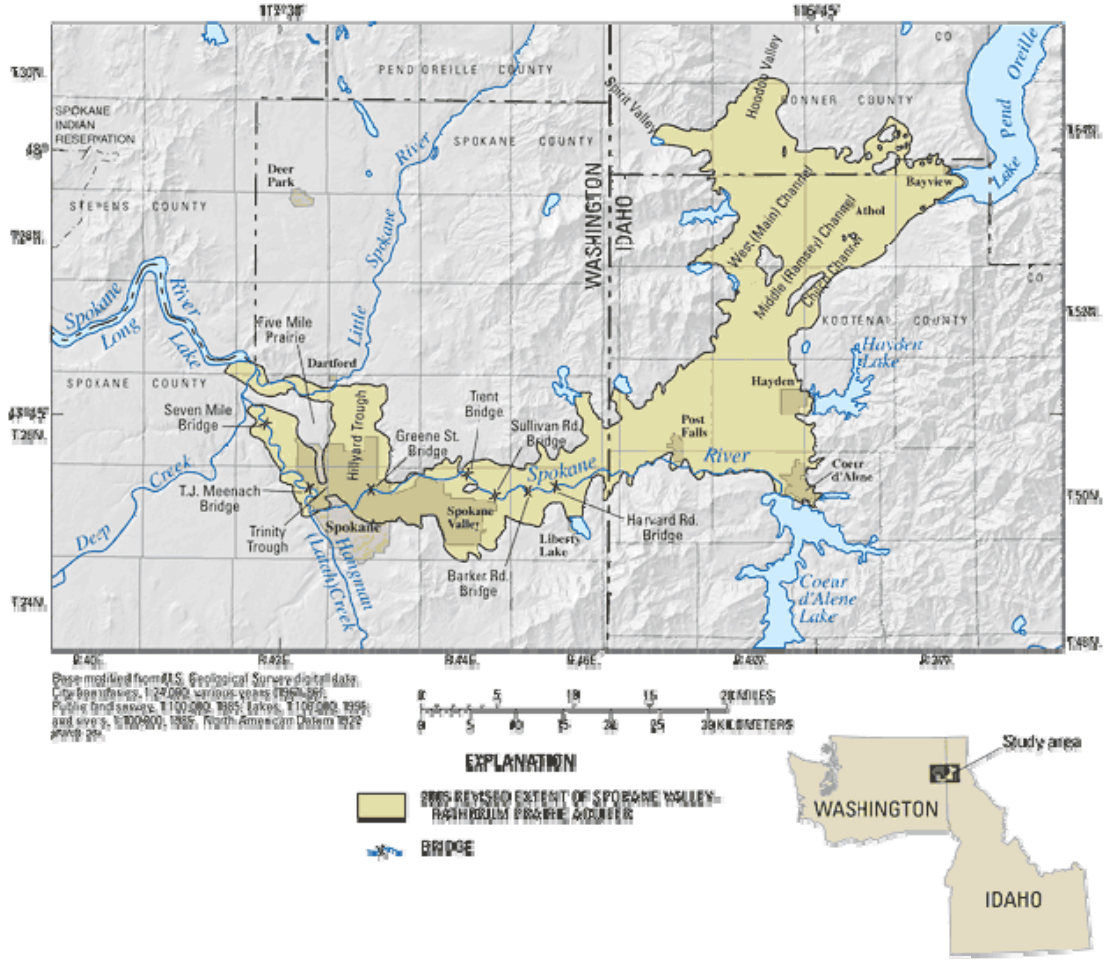
4.2 Silvicultural Plan

Section IV.B of the application (page 15) states that "since no harvesting plan is proposed, a Silvicultural Plan should not be required in the new WLAP." The purpose of the silvicultural plan is to describe the facility's plan for the care and management of the trees on the site, including nutrient loading and thinning when necessary. In the case of TLV, it is suggested that the facility include documentation of their plans and methods to restore tree cover to HMUs A and B (and someday D) as well as maintain healthy trees on the other management units. For the full text, see Section E, condition CA-167-03.

4.3 Spokane Valley – Rathdrum Prairie Aquifer

The Spokane Valley – Rathdrum Prairie aquifer (SVRPA) underlies much of the region between Lake Pend Oreille in northern Idaho and Long Lake in eastern Washington (see Figure 1). The SVPRA was designated a Sole Source Aquifer by the EPA in 1978 under the provisions of the Safe Drinking Water Act of 1974. A sole source aquifer is defined by the EPA as supplying at least fifty (50) percent of the drinking water consumed in the

Figure 1 Extent of Spokane Valley - Rathdrum Prairie Aquifer (USGS, 2005)



area which overlies it (EPA, 2008). The State of Idaho has additionally classified the SVRPA as a Sensitive Resource Aquifer, stating that "the aquifer shall not be degraded, as it relates to beneficial uses, as a result of point source or nonpoint source activity unless it is demonstrated by the person proposing the activity that such change is justifiable (IDAPA 58.01.11.300.01.a.i)."

The facility is physically located south of Round Mountain near the confluence of the West and Ramsey channels of the aquifer (see Figure 2). Analysis of drill logs for private drinking water wells to the east of the facility show that the facility is likely not located directly over the aquifer since many of the wells drive into granite bedrock layers before producing water. The aquifer is found above the bedrock in the sand and gravel layers deposited by ancient floodwaters. The proximity of the site to the converging channels of the aquifer makes it important that the facility manage their wastewater responsibly. Staff recommends that the facility monitor two of the drinking water wells on the east side of the site (#3 and #15 in Figure 3) to verify that no changes are occurring to the local aquifer. All of the four wells shown to the west of the site (Numbers 28, 25, 6 and 5 in Figure 3) are located in the West Channel of the SVRPA. The water in the SVRPA

moves quickly, up to fifty (50) feet per day in some areas, therefore sampling for evidence of wastewater reuse is not recommended in these wells.

Figure 2 Detail of SVRPA West and Ramsey Channels Confluence (modified from DEQ, 2005)

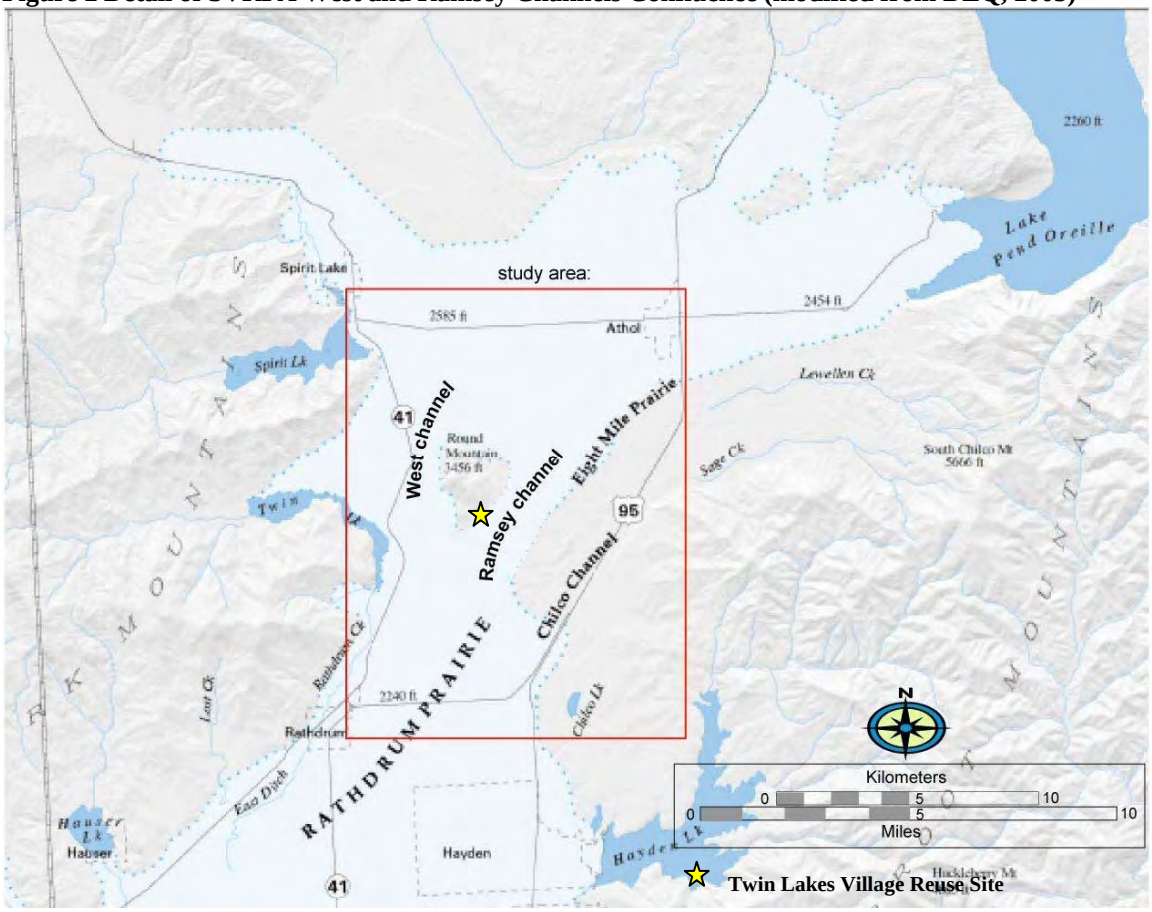
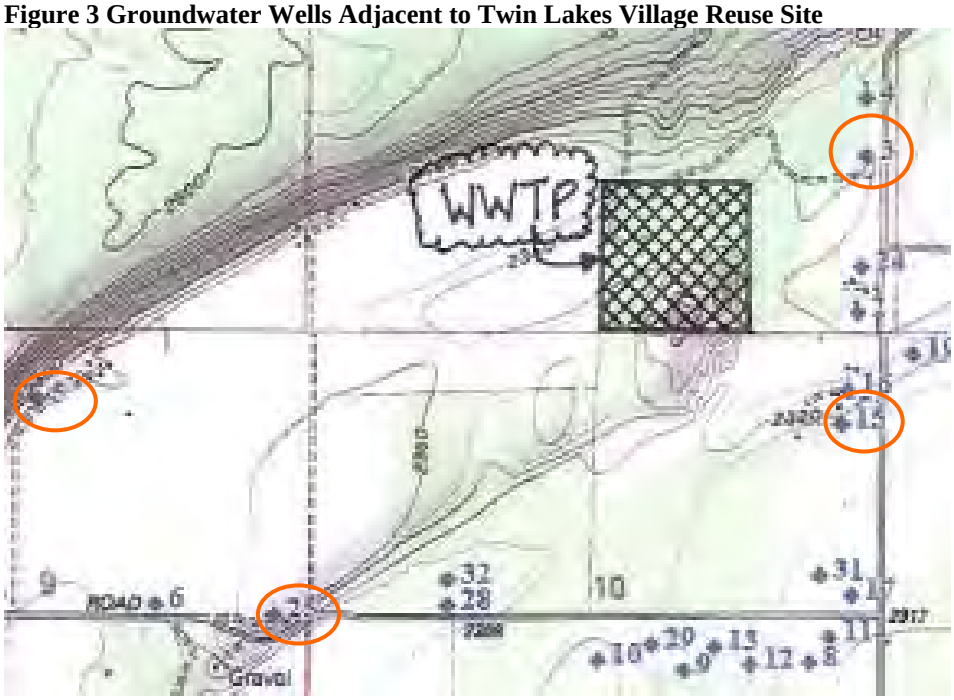


Figure 3 Groundwater Wells Adjacent to Twin Lakes Village Reuse Site



4.4 Hydraulic Management Unit Configuration

The facility has requested that the site acreages be updated to reflect the configuration of the site as it was constructed. No physical changes have been made to the site since construction; however, some of the HMUs deviate from the original design due to the fact that during construction the lagoons had to be relocated as a result of unsuitable soils. New site maps are included that show the new acreages and locations (totaling 22.67 acres) of the HMUs and the associated lagoons. The irrigation distribution system of the site remains a configuration of buried distribution lines and risers connecting to quick-coupled 3-inch surface-laid aluminum irrigation piping with sprinkler heads and laterals at 40-foot intervals. In order to be consistent across the entire Reuse Program, staff recommends renumbering the HMUs, the wastewater discharge point, and the lagoons for the next permit cycle, as shown in Table 1 for the HMUs.

Table 1 TLV Hydraulic Management Unit Serial Numbers*

Current Serial Number	Proposed Serial Number	Description
MU-0167.01A	MU-016701	HMU A
MU-0167.01B	MU-016702	HMU B
MU-0167.01C	MU-016703	HMU C
MU-0167.01D	MU-016704	HMU D
MU-0167.01E	MU-016705	HMU E
MU-0167.01F	MU-016706	HMU F
---	---	HMU G

The facility has additional unused acreage that it wishes to consider for future wastewater land treatment. Currently, a portion of this area (HMU D) is not employed for wastewater reuse while the other part (HMU G) serves as an additional site buffer zone. DEQ staff does not recommend permitting either HMU D or HMU G at this time, as it is unlikely that the facility will require the acreage during the next permit cycle based on past nutrient loading trends. HMU D has not yet been developed and the facility has stated that they do not intend to develop this HMU until flows start to approach 12 MG/year. It is suggested that TLV prepare a proposal to develop HMU D by the end of the next permit cycle and submit as part of the reapplication process. Section E, condition CA-167-04 requests the facility to submit for DEQ review and approval a development plan for HMU D with their reapplication materials, six months prior to the expiration of the proposed permit.

4.5 Wastewater Flows and Constituent Loading Rates

Trending of wastewater flow rates and rationale for constituent and hydraulic loading rates appearing in the draft permit are discussed below.

4.5.1 Wastewater Flows

No significant changes in wastewater flows were reported by the facility (TLI, 2007). The facility has indicated its intent to operate at the Class C level and will modify the system to increase the effectiveness of the disinfection. The nearest inhabited dwelling is 420 feet from the west side of the site, which is greater than the 300-foot buffer zone for Class C. It is recommended that the disinfection limit be changed to Class C with a median value less than 23 CFU/ 100 mL.

Wastewater application has ranged from 5.54 MG on 6.94 acres in 2001 (Kimball, 2002) to 8.95 MG on 19.07 acres in 2005 (TLI, 2006). If future growth follows the trend suggested by the past six years of data, the facility should not approach the current permit limit of 14 MG within the next permit cycle. For a more detailed discussion of the hydraulic loading rate, please see Section 4.3.2.2.

4.5.2 Constituent Loading Rates

The sections below discuss proposed constituent loading rates, including nitrogen and phosphorus. No changes to the current loading rate limits were requested (TLI, 2007b).

4.5.2.1 Nitrogen Management and Loading Rates

The current permit sets a limit of 150 lbs/ac-yr for nitrogen. The facility did not propose any changes to this loading limit (TLI, 2007b). The site average Total Nitrogen (consisting of nitrate, nitrite and TKN) loading during the period from 2001 through 2006

ranged from 44.8 lbs/acre in 2004 (TLI, 2005) to 79.3 lbs/acre in 2002 (Kimball, 2003). The data shows a decreasing trend in nitrogen loading over the past permit cycle so staff recommends continuing with the current nitrogen limit of 150 lbs/acre. All samples from the facility have been analyzed for the necessary constituents but not all of the reported data is being used in the calculation. For the next permit cycle, staff recommends that the facility use all forms of nitrogen to calculate their total nitrogen loading.

4.5.2.2 Hydraulic Loading Rates

Growing season hydraulic loading should be substantially equal to the irrigation water requirement (IWR) for a forested site. Areas with significant tree coverage were approximated by "Orchards – Apples and Cherries no ground cover," for the remaining areas "Grass Pasture – low management." Due to uneven tree cover in HMUs A and B, tree cover was estimated to be 60% and 50% for each management unit, respectively, with the remainder comprising grasses. Using these approximations the IWR was calculated to a total of 11.92 MG (see Table 2). The facility has applied between 5.54 MG in 2001 (Kimball, 2002) and 8.95 MG in 2005 (TLI, 2006) which is below the calculated IWR.

Table 2 TLV Hydraulic Management Unit Summary*

Current Serial Number	Proposed Serial Number	Description	Acres	Capacity** (MG)	Status
MU-0167.01A	MU-016701	HMU A	3.48	2.11	Active
MU-0167.01B	MU-016702	HMU B	4.00	2.38	Active
MU-0167.01C	MU-016703	HMU C	4.07	2.61	Active
MU-0167.01D	MU-016704	HMU D	3.60	---	Proposed Future
MU-0167.01E	MU-016705	HMU E	3.69	2.37	Active
MU-0167.01F	MU-016706	HMU F	3.83	2.46	Active
---	---	HMU G	1.51	---	Proposed Future
	Active HMUs	HMUs A-C, E&F	**19.07**	**11.92**	

* Adapted from Table #3 (page 9) of permit application (TLI, 2007)

** Based on ET data from http://www.kimberly.uidaho.edu/ETIdaho/stninfo.php?station=100667 for a representative mix of Orchard without Groundcover and Grass Pasture based on cover, assuming 85% sprinkler efficiency.

The facility has not requested any changes beyond updating site acreages. In the event that loading rates significantly change over the next permit cycle and additional acreage is required, TLV is encouraged to submit the design and management plans for HMU D as part of a permit modification request.

4.5.2.3 Phosphorus Loading Rates

The current permit includes a phosphorus (P) loading limit of 38 lbs/acre. Phosphorus loading rates are generally set by DEQ based upon either ground water or surface water

concerns. With respect to ground water concerns, DEQ does not usually set a phosphorus loading limit where there is no ground water/surface water interconnection (i.e. where ground water discharging from the down-gradient boundary of the treatment site does not enter surface water). There are no seasonal tributaries immediately adjacent to the facility and the Rathdrum Prairie Aquifer divides to pass on either side of Round Mountain, so there is little likelihood of impacts to the aquifer. Also, the facility applies P at relatively low rates, between 16.8 lbs/acre (TLI, 2007a) and 25.7 lbs/acre (TLI, 2006). In addition, wastewater is not applied during precipitation events as a means to minimize potentially phosphorus-bearing sediment runoff and therefore phosphorus contamination in the nearest surface water (Twin Lakes) should not become a concern during the new permit cycle. A runoff control plan is also included as part of the Plan of Operation compliance activity in Section E, CA-167-01 of the draft permit. As a consequence, staff recommends removing the numerical phosphorus loading limit in the draft permit. Continued monitoring of phosphorus concentrations and site loading is recommended at this time in order to continue to track loading trends.

4.6 Lagoons

In Section V.A (page 22) of the application materials, the facility (TLI, 2007b) proposed two compliance activities for the draft permit with regard to the lagoons. The first was to repair holes in the liner of both lagoons, while the second was to perform seepage rate testing. The holes in the liner were repaired in 2007 as a result of the May 2006 facility inspection. Consequently, staff recommends that maintenance of the liner be included in the updated Plan of Operation. Staff also recommends that seepage rate testing be performed. These two tasks are proposed as compliance activities for the next permit cycle. See Section E, conditions CA-167-01 and CA-167-02, of the attached draft permit for the full text of these conditions.

4.7 Drainfields

The current permit does not include provisions for regulating the operation of the community drainfield. The facility should refer to IDAPA 58.01.03 (Individual/Subsurface Sewage Disposal Rules) for regulations regarding LSASs and if there are questions contact the Coeur d'Alene Regional Office.

5.0 Conclusion

The following recommendations fall into two major areas. They include loading rate related and other recommendations.

5.1 Loading Rate Related Recommendations

1) It is recommended that the hydraulic loading substantially follow IWR, as discussed in Section 4.5.2.2.

2) It is recommended that the total nitrogen loading limit of 150 lbs/acre be continued, as discussed in Section 4.5.2.1.

3) It is recommended that the current phosphorus loading limit of 38 lbs/acre be removed, as discussed in Section 4.5.2.3.

4) It is recommended that the facility continue to monitor and report phosphorus concentrations and loadings, as discussed in Section 4.5.2.3.

5) It is recommended that the facility combine all forms of nitrogen in calculating their yearly nitrogen loading as discussed in Section 4.5.2.1.

5.2 Other Recommendations

1) It is recommended that the facility perform monitoring of two neighboring drinking water and also the subdivision municipal wells, as discussed in Section 4.3.

2) It is recommended that a proposal for development of HMU D (MU-016704) be prepared, as discussed in Section 4.4.

3) It is recommended that seepage testing be performed on both lagoons, as discussed in Section 4.6.

4) It is recommended that the serial numbers of the HMUs be updated as discussed in Section 4.4

5) It is recommended that the facility prepare a Silvicultural Plan for the site, as discussed in Section 4.2.

6.0 References Cited

DEQ, 2005. Idaho Department of Environmental Quality. June 2005. The Ramsey Channel of the Spokane Valley-Rathdrum Prairie Aquifer. Ground Water Quality Technical Report No. 25.

EPA, 2008. Environmental Protection Agency. Website accessed 2/12/2008. http://cfpub.epa.gov/safewater/sourcewater/sourcewater.cfm?action=SSA

Kimball, 1998. Kimball Engineering for Twin Lakes Investment Partnership. September 1998. Twin Lakes Village Wastewater Land Application Preliminary Technical Report and Plan of Operation.

Kimball, 2002. Kimball Engineering for Twin Lakes Investment Partnership. February 8, 2004. Twin Lakes Village Annual Wastewater Land Application Site Performance Report LA-000167-01 [2001]

Kimball, 2003. Kimball Engineering for Twin Lakes Investment Partnership. January 23, 2004. Twin Lakes Village Annual Wastewater Land Application Site Performance Report LA-000167-01 [2002]

TLI, 2004. TLI Sewer, LLC. January 23, 2004. Twin Lakes Village Annual Wastewater Land Application Site Performance LA-000167-01 2003

TLI, 2005. TLI Sewer, LLC. January 23, 2005. Twin Lakes Village Annual Wastewater Land Application Site Performance Report LA-000167-01 2004

TLI, 2006. TLI Sewer, LLC. January 30, 2006. Twin Lakes Village Annual Wastewater Land Application Site Performance LA-000167-01 2005

TLI, 2007a. TLI Sewer, LLC. January 19, 2007. Twin Lakes Village Annual Wastewater Land Application Site Performance Report LA-000167-01 2006

TLI, 2007b. Lake City Engineering for TLI Sewer, LLC. February 7, 2007. Twin Lakes Village Application for Renewal Wastewater Land Application Permit.

USGS, 2005. United States Geological Survey. 2005. Figure 1 of *Compilation of Information for Spokane Valley–Rathdrum Prairie Aquifer, Washington and Idaho*. http://pubs.usgs.gov/sir/2005/5227/section3.html. Accessed 2/12/2008.

cc: WLAP Source File no. LA-000167-02 (SO & CRO)
Gary Gaffney, CRO
Mike Spomer, SO
Richard Huddleston, SO

7.0 Appendices

7.1 Documentation Regarding Community Drainfield at Twin Lakes Village

7.1.1 Panhandle Health District Letter Dated November 24, 2003 (scanned)

7.1.2 Email Clarification Dated December 1, 2003 (scanned)

7.2 Memorandum Dated July 9, 2001

7.1.1 Panhandle Health District Letter Dated November 24, 2003 (scanned)

PANHANDLE HEALTH DISTRICT

Healthy People in Healthy Communities

2195 IRONWOOD COURT
COEUR D'ALENE, IDAHO 83814
http://www2.state.id.us/phd1

Public Health

November 24, 2003

Mike Becker
JUB Engineers, Inc.
7825 Meadowlark Way, Suite A
Coeur d' Alene, ID 83814

Re: Twin Lakes Village Community Sewer

Dear Mr. Becker:

This letter is to follow up our meeting on November 19, 2003, in which the following persons were in attendance: Ken Babin, Gary Gaffney, Jim Kimball, Mike Becker, and Erik Ketner.

The Twin Lakes Village Community Sewer System currently loads the on-site drainfields six months of the year, and is pumped off-site to a storage lagoon and land applied the other six months of the year. It is our understanding that through this separation of flows the Idaho Division of Environmental Quality allowed the original 307 approved connections to be increased to a potential 500 connections.

The Panhandle Health District agrees with the increase in connections per the following conditions:

-The on-site drainfields cannot be loaded more than six months of the year.

-The loading rate to each drainfield module, as monitored and submitted annually by JUB Engineering, cannot exceed 1.0 gallon per square foot per day.

-A physical account of all connections to the Twin Lakes Village Community Sewer must be submitted to the Panhandle Health District.

-Building permits must still be submitted to the Panhandle Health District for documentation purposes.

If you have any questions I can be reached in the Coeur d' Alene office at (208) 667-9513.

Sincerely,

Erik Ketner
Environmental Health Specialist

Cc: Gary Gaffney, Idaho Division of Environmental Quality
Ken Babin, EHS Supervisor, Panhandle Health District

7.1.2 Email Clarification Dated December 1, 2003 (scanned)

Mike Becker

From: GARY GAFFNEY [GGAFFNEY@DEQ.STATE.ID.US]
Sent: Monday, December 01, 2003 3:46 PM
To: eketner@phd1.state.id.us
Cc: Jim Kimball; kbabin@phd1.state.id.us; kmbeng@spro.net
Subject: Twin Lakes Village Sewer System

Erik,

Your November 24th letter to Mike Becker was good and touched what I thought were the major topics from the meeting. I would like to elaborate a little bit on some of the conditions you listed so that we are all 100% clear.

- The drainfield can only be used November 1st to April 30th. The WLAP system can only be used per our permit from May 1st to October 31st. There is no problem in an emergency with pumping to the lagoons. However, I believe Ken Babin once indicated that using the drainfields at all outside the Nov 1st to April 30th period was not allowed.
- I understand that the 1 gallon/ft.2/day maximum loading rate to any of the drainfields is based on a six month application period - total flow/area of each drainfield/181 days. It is not an annual 365 day average.
- Mike is inventorying all present connections and will include the number in the Annual Report required by the WLAP during January 2004. This should include the active number of EHUs, the number of EHUs that are not connected but have purchased or otherwise have rights to a sewer connection, and the number of year round Elkhorn Ranch 2nd Additions going into the lagoons.
- It was agreed that the January Annual Report will include a drainfield report. Since the calendar year and the drainfield use period do not exactly coincide, I am not sure whether we intended to have the engineer split the drainfield use report ending December 31st. or report differently. If it is more convenient, we would not object to the Annual Report containing the previous winter's 6-month of continuous use drainfield data - for example the 2003 Annual Report would contain the November 2002 to April 2003 drainfield data and the May-October 2003 WLAP data. Also a copy of the annual report should go to the PHD so they can review the # connections and loading rate data.
- Once Mike establishes a current # connections, the PHD will maintain a running total of sewer connections based on building permit signoffs they get on a day-to-day basis. The January Annual Reports will contain TLV's tally of total connections made to the sewer system based on their records. The two EHU numbers will need to be the same as of January 1st each year.
- Sewage from 16 lots Elkhorn Ranch 2nd Addition in the form of septic tank effluent pumped via a pressure STEP line into the TLV lagoons goes there year round and does not enter into the 500 EHU maximum capacity in the TLV system at Twin Lakes Village. If the lagoons start to show capacity limitations, we will then discuss the problem with the owner. Erik will permit the tanks in this subdivision based on the standard detail, TLV will permit individual lot service connections from the main to the pump discharge and keep track of the number of connections, and the Idaho Plumbing Bureau will permit plumbing from the house to septic tank inlet.

Please let me know if any of the above is contrary to what we agreed to during the meeting or in the past dealings. Otherwise I will assume everyone is in agreement.

Gary J. Gaffney, P.E.
Idaho Department of Environmental Quality
2110 Ironwood Parkway
Coeur d'Alene, ID 83814
208-769-1422
208-769-1404 fax
ggaffney@deq.state.id.us

7.2 Memorandum Dated July 9, 2001

July 9, 2001

M E M O R A N D U M

TO: Rick Huddleston, P.E., Engineering Manager I
Wastewater Section

FROM: Gary Gaffney, P.E., Staff Engineer
Coeur d'Alene Regional Office

SUBJECT: (Final) Staff Analysis of the Twin Lakes Village Wastewater Land Application Permit (Municipal Wastewater)

Summary

The Twin Lakes Village (TLV) system serves a residential development and golf course located near Twin Lakes in Kootenai County. It consists of about 300 existing connections and has been approved for 500 total connections with completion of the recent wastewater system improvements. During six months of the winter, the TLV system will utilize a series of drainfields permitted by the Panhandle Health District and located within the development for disposal of septic tank effluent. During the summer period, the effluent will be pumped to a remote site where it will enter a 0.9 MG aerated lagoon and a 2.8 MG storage lagoon. Both lagoons have a 60-mil HDPE liner and have passed seepage tests. Wastewater will then be disinfected and used to spray irrigate 21.5 acres of forested land adjacent to the lagoons. Application rates at this site will be less than 24-inches per year (maximum of 14 MGA) and comply with the guidance for land application over the Rathdrum Prairie Spokane Valley Aquifer; a sole source and Sensitive Aquifer afforded non- degradation protections. Monitoring will consist of daily flow and monthly nutrient and bacteria sampling. No ground water or soil monitoring has been required because of the low rate of application and the low risk of contamination. Within one year (May 2002), the permit requires the owner have a state certified wastewater operator.

Staff recommends issuing a draft permit for this new site in accordance with this staff analysis.

Purpose

The purpose of this memorandum is to satisfy the requirements of IDAPA 16.01.17400.04 (Wastewater-Land Application Permit Regulations) for issuing land application permits. It states the principal facts and significant questions considered in preparing the draft permit conditions or the intent to deny, with a summary of the basis for the draft conditions or denial with references to applicable requirements and supporting materials.

General Background

The TLV wastewater system serves a 200-acre residential and recreation area (100-acre golf course) on the south end of Twin Lakes in Kootenai County consisting of a mixture of single family and multiple unit (condominium) residences. The population at TLV is much higher in the warmer months and has been estimated. Based on actual low data, DEQ has agreed to a 170-gpd/connection design flow rate for TLV.

Within the development, the collection, treatment (septic tanks with a total capacity of 134,770 gallons) and conveyance system to the drainfields or lagoons has been completed and is operational.

The Plan of Operation proposes to use the existing ten TLV drainfields from November 1st until April 31st. During this six month period, the designers have estimated that the ultimate wastewater flow from 75% of 500 residences (the owners association estimates 45% of the residences are gone during the winter months) will contribute 11.5 MG to the drainfields. This is less than the current subsurface sewage disposal of wastewater year round from all existing 300 users, which in 1995 was 14.6 MG. Because the land application system will result in an overall reduction of subsurface sewage disposal at TLV, the Panhandle Health District has approved use of the drainfields by up to 500 users at TLV.

The land application system will start May 1st and end October 31st. Up to 85,000 gpd of septic tank effluent will be pumped to the lagoon site - a 40-acre parcel located in a rural setting. The effluent will be delivered to a 0.9 MG aerated lagoon where supplemental aeration can be used to maintain aerobic conditions and further the wastewater treatment processes. Overflow from the aerated lagoon will enter the adjacent 2.8 MG storage lagoon. Both lagoons are sealed with a 60-mil HDPE liners.

Stored wastewater will be disinfected with a liquid chlorine system and pumped by two 250-gpm submersibles to the land application area. On the way, the wastewater will pass through 940 lineal feet of 14-inch diameter pipe gallery for chlorine contact purposes. The land application area consists of five proposed management areas (MU-A through E) supplied by buried distribution lines and risers connecting to quick-coupled 3-inch surface laid aluminum irrigation piping with sprinkler heads and laterals at 40-foot spacings.

The design estimates that 15.6 MG of wastewater from 500 users in TLV could ultimately be received during the summer months. Initially, the flows will be much less than the 85,000-gpd design flow as TLV grows from the present 300 users at a rate of 10-25 new users per year.

The treated wastewater will be land applied on 21.5 acres of forested land. Application rates will vary on a monthly basis during the season based on precipitation received and crop needs. The design intends to employ an irrigation rate that avoids significant ground water recharge from the site and maximizes the evaporation and transpiration uses of the applied wastewater. Table 6 of the Plan of Operation established the monthly application rates. No more than the monthly rates adjusted for precipitation or 24-inches per year will be land applied. Based on this, the proposed land application site has a capacity to treat 14 MG annually on the 21.5 acres of forested land.

If during the five-year period of this permit, the actual flows approach the 14-MG capacity of the proposed irrigation areas, the owner will develop with DEQ approval additional land for irrigation.

Proposed Land Application Site: Soils, Climate, Growing Season and Crops

The proposed land application site is on 40 acres of private land with a 50-foot buffer on the north, east, and south and a 100-fot buffer on the west side towards the Elkhorn subdivision

Soils: The Plan of Operation discusses the soil type and conditions and concludes that the silty loam soils are acceptable for treatment of the applied wastewater.

Climate: The Plan of Operation discusses the local climate and concludes that the site is acceptable for treatment of the applied wastewater. Sufficient flexibility is present in the system for the operator to successfully manage the system regardless of the climatic changes.

Growing Season and Crops: The land application site is currently not irrigated and has an immature forest. Land application of wastewater can be done successfully during the growing season on this type of crop to achieve proper wastewater treatment and disposal.

Staff Recommended Draft Permit Conditions
1. The growing season shall be May 1 through October 31. 2. Wastewater application only during the growing season. 3. The maximum annual application rate shall be 24 inches.

Wastewater Quantity and Quality

TLV's current total annual wastewater flow is approximately 14 million gallons (MG) and is projected to reach 27 MGA at ultimate buildout with 500 connections. The quality will consist of septic tank effluent with additional biological treatment of about 30 days in the aerated lagoon, disinfection to a level of 23 organisms/100 ml. total coliform bacteria or less, and final treatment by land application at the consumptive rate of the site.

Wastewater Process Description

During the non-growing season, wastewater will be disposed of in existing subsurface drainfields located within the TLV golf course. During the growing season, wastewater will be pumped to the aerated lagoon for additional treatment and storage. A sodium hypochlorite system and an oversized transmission pipeline will provide a minimum of 30 minutes of detention time for disinfection prior to land application on forested land. The applicant proposes to use 21.5 acres for wastewater land application organized into five management units.

Land Application Analysis

Staff has analyzed the TLV's wastewater land application proposal and finds as follows:

- The proposed site has soils and vegetation suitable for wastewater land application.
- The proposed land application site acreage (21.5 acres) is sufficient to accept the TLV=s initial summer wastewater design flow (14 MG) at the maximum hydraulic application rate (24 inches/year).
- At the maximum hydraulic application rate, the wastewater constituent loadings are acceptable.
- Nitrogen (nutrient application rate) is the limiting factor for the proposed land application site.

Ground Water

Ground water in this area is approximately 120-150 feet deep. The nearest ground water well serves the recently developed Elkhorn Estates public drinking water system located about 3,000 feet southwest of the site. The synthetically lined lagoons at the proposed land application site should eliminate any impacts from the new lagoons to ground water. The constituent loadings to the proposed site are well below guideline values. The new wastewater land application system should have no measurable impact on local ground water quality, and staff recommends no ground water monitoring for this new facility.

Buffer Zones, Fences and Signs

The design engineer has proposed wastewater disinfection below secondary disinfection level (23 total coliform organisms/100 ml) and designed a disinfection system and chlorine contact system. The proposed new site meets guideline buffer zones for secondary disinfection (23 total coliform organisms/100 ml), and staff recommends guideline buffer zone distances in the draft permit.

The land application site must be fenced.

Staff Recommended Draft Permit Condition
4. The wastewater disinfection level shall be secondary disinfection (23 total coliform organisms/100 ml). 5. The draft permit shall include guideline buffer zone distances for public contact, residences, and wells. 6. The fencing and sign requirements around the land application site shall be installed per guidelines.

Sampling and Monitoring

Staff proposes sampling and monitoring requirements consistent with the draft Municipal General Permit, as follows:

Wastewater: Staff recommends during irrigation periods: weekly flow meter readings to each hydraulic unit; monthly TKN, nitrate-nitrite, and total coliform sampling; and annual calculations of the nitrogen and phosphorous loading to each hydraulic management unit.
Crop: Since the crop is an established immature forest, annual crop sampling is unnecessary. The permittee will not need to prepare and implement a silvacultural plan for replanting and harvesting during this five-year permitting period.
Supplemental irrigation: If supplemental irrigation is employed, monthly flows of this irrigation water to each hydraulic management unit (HMU) must be recorded.
Constituent loadings: Monthly wastewater (inches and volume) and annual phosphorous and nitrogen loading calculations are recommended.
Soils: No sampling,
Groundwater: Ground water monitoring is not recommended.

Staff Recommended Draft Permit Condition
7. The draft permit shall include the sampling and monitoring provisions as described in this section.

Recommendations for the Draft Permit

Recommendations for the draft permit are contained with the text boxes within this staff analysis. Staff recommends land application of wastewater be permitted contingent upon the recommendations in this staff analysis.

Enclosure

cc: WLAP Source File no. LA-000167-01
Cœur d'Alene Regional Office WLAP File - LA-000167-01